

=> FILE REG

FILE 'REGISTRY' ENTERED AT 17:34:49 ON 17 AUG 2007  
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=> DISPLAY HISTORY FULL L1-

FILE 'REGISTRY' ENTERED AT 17:00:58 ON 17 AUG 2007  
E NICKEL/CN  
L1 1 SEA NICKEL/CN  
E COPPER/CN  
L2 1 SEA COPPER/CN  
E LITHIUM/CN  
L3 1 SEA LITHIUM/CN

FILE 'HCA' ENTERED AT 17:06:06 ON 17 AUG 2007  
L4 241490 SEA (BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?  
OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY)(2A)(CE  
LL OR CELLS) OR WETCELL? OR DRYCELL?)/BI,AB  
L5 246455 SEA ANOD## OR (NEG# OR NEGATIV?)(2A)ELECTROD##  
L6 10135 SEA (L3 OR LITHIUM# OR LITHIAT? OR LI)(2A)(FILM? OR  
COAT? OR LAYER?)  
L7 344311 SEA L1  
L8 541678 SEA L2  
L9 2740 SEA MEAN#(2A)(ROUGH? OR COARS?)  
L10 5758 SEA (COND# OR CONDUCT?)(2A)(AGENT? OR ADDITIV?)  
L11 54653 SEA METAL####(2A)(POLYM# OR POLYMER? OR COPOLYM# OR  
COPOLYMER? OR HOMOPOLYM# OR HOMOPOLYMER? OR RESIN?)  
L12 53052 SEA (COND# OR CONDUCT?)(2A)(POLYM# OR POLYMER? OR  
COPOLYM# OR COPOLYMER? OR HOMOPOLYM# OR HOMOPOLYMER? OR  
RESIN?)  
L13 2095 SEA L4 AND L5 AND L6  
L14 1 SEA L13 AND L9  
L15 2312 SEA L5 AND L6  
L16 1 SEA L15 AND L9  
L17 64548 SEA L4 AND L5  
L18 6 SEA L17 AND L9  
L19 43 SEA L5 AND L9  
L20 13 SEA L4 AND L9  
L21 1 SEA (L19 OR L20) AND L6  
L22 11 SEA L6 AND L9  
L23 QUE L3 OR LITHIUM# OR LITHIAT? OR LI  
L24 6 SEA L19 AND L23  
L25 2 SEA L19 AND (L10 OR L11 OR L12)  
L26 1 SEA L19 AND L7  
L27 12 SEA L19 AND L8  
SEL L14 1 RN

FILE 'REGISTRY' ENTERED AT 17:26:42 ON 17 AUG 2007  
L28 32 SEA (7704-34-9/BI OR 114239-80-4/BI OR 1332-29-2/BI OR

FILE 'HCA' ENTERED AT 17:26:50 ON 17 AUG 2007  
L29 1843654 SEA L28  
L30 15 SEA L19 AND L29  
L31 6 SEA L14 OR L16 OR L18 OR L21 OR L24 OR L25 OR L26  
L32 28 SEA (L20 OR L22 OR L27 OR L30) NOT L31  
L33 3 SEA 1840-2002/PY,PRY AND L31  
L34 14 SEA 1840-2002/PY,PRY AND L32  
L35 17 SEA (L31 OR L32) NOT (L33 OR L34)

=> FILE HCA  
FILE 'HCA' ENTERED AT 17:35:04 ON 17 AUG 2007  
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=> D L33 1-3 BIB ABS HITSTR HITIND

L33 ANSWER 1 OF 3 HCA COPYRIGHT 2007 ACS on STN

AN 140:342224 HCA Full-text

TI Anode for lithium secondary battery

IN Lee, Jea-Woan; Cho, Chung-Kun

PA Samsung SDI Co., Ltd., S. Korea

SO U.S. Pat. Appl. Publ., 10 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 2004081889	A1	20040429	US 2003-603777 200306 26
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KR	2004036438	A	20040430	KR 2002-65483 200210 25
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JP	2004146348	A	20040520	JP 2003-164281 200306 09
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EP	1416573	A2	20040506	EP 2003-90199 200307 04
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EP	1416573	A3	20040804	
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,  
SK

CN	1492529	A	20040428	CN 2003-145389 200307 07
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KR	2005039774	A	20050429	KR 2005-16541 200502 28
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PRAI KR 2002-65483 A 20021025 <--

AB A neg. electrode for a lithium secondary battery includes a substrate having a mean roughness of 30 to 4000 Å and a lithium layer coated on the substrate, and a lithium secondary battery includes the neg. electrode. The obtained lithium secondary battery has improved cycle-life characteristics.

IT 7439-93-2, Lithium, uses  
(anode for lithium secondary battery  
)

RN 7439-93-2 HCA

CN Lithium (CA INDEX NAME)

Li

IT 7440-02-0, Nickel, uses  
(substrate; anode for lithium secondary  
battery)  
RN 7440-02-0 HCA  
CN Nickel (CA INDEX NAME)

Ni

IC ICM H01M004-64  
ICS H01M004-60; H01M004-58; H01M004-48  
INCL 429233000; 429245000; 429231950; 429231100; 429218100; 429213000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38  
ST anode lithium secondary battery  
IT Battery anodes  
Perovskite-type crystals  
(anode for lithium secondary battery  
)  
IT Carbon black, uses  
Carbonaceous materials (technological products)  
Fluoropolymers, uses  
(anode for lithium secondary battery  
)  
IT Polyamides, uses  
(anode for lithium secondary battery  
)  
IT Polycarbonates, uses  
(anode for lithium secondary battery  
)  
IT Polyesters, uses  
(anode for lithium secondary battery  
)  
IT Polyolefins  
(anode for lithium secondary battery  
)  
IT Chalcogenides  
Oxides (inorganic), uses  
(lithiated; anode for lithium  
secondary battery)  
IT Secondary batteries  
(lithium; anode for lithium  
secondary battery)  
IT Conducting polymers  
(substrate; anode for lithium secondary  
battery)  
IT Metals, uses  
Polyacenes  
Polyacetylenes, uses  
(substrate; anode for lithium secondary  
battery)  
IT 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, compd. 9002-88-4,  
Polyethylene 9003-07-0, Polypropylene 9010-79-1,

Ethylene-propylene copolymer 63143-57-7D, Carbon sulfide, polymer  
74432-42-1, Lithium polysulfide  
(anode for lithium secondary battery  
)

IT 1332-29-2, Tin oxide 7439-93-2, Lithium, uses  
7440-31-5, Tin, uses 7782-42-5, Graphite, uses 9002-84-0, Ptfe  
9002-86-2, Polyvinyl chloride 9003-53-6, Polystyrene 9011-14-7,  
Pmma 13463-67-7, Titanium oxide, uses 14417-93-7, Tin phosphate  
24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile  
(anode for lithium secondary battery  
)

IT 24968-12-5, Polybutylene terephthalate 25038-59-9, Polyethylene  
terephthalate, uses 413569-08-1, 2-Propenoic acid, ion(1-)  
homopolymer, uses  
(anode for lithium secondary battery  
)

IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses  
25067-58-7, Polyacetylene 25190-62-9, Poly(p-phenylene)  
25233-30-1, Polyaniline 25233-34-5, Polythiophene 28774-98-3,  
Polynaphthalene-2,6-diyl 30604-81-0, Polypyrrole 82451-56-7,  
Polyazulene 96638-49-2, Poly(phenylene vinylene) 114239-80-4,  
Polyperinaphthalene  
(substrate; anode for lithium secondary  
battery)

L33 ANSWER 2 OF 3 HCA COPYRIGHT 2007 ACS on STN

AN 139:103765 HCA Full-text

TI Secondary lithium battery anodes

inhibiting deformation in repeated charging and discharging, and  
same batteries

IN Kusumoto, Yasuyuki; Fukui, Atsushi; Nakamura, Hiroshi

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 2003203637	A	20030718	JP 2001-401286	
			200112	
			28	

US 2003148185	A1	20030807	US 2002-329571	
			200212	
			27	

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US 6946223 B2 20050920

PRAI JP 2001-401286 A 20011228 <--

AB The anodes comprise anode active mass capable of alloying with Li, and current collectors with proportional limit  $\geq 2.0 \text{ N/mm}$ . Alternatively, the anodes are prep'd. by applying active mass contg. Si-contg. substances, elec. conductive carbon materials, and binders on the surface of current collectors, and sintering in nonoxidizing atm.; wherein the arithmetic mean roughness (Ra) of the current collector surface is  $\geq 0.2 \mu\text{m}$ , the thickness (X  $\mu\text{m}$ ) of the active mass layer satisfies  $[250 \geq (X/Ra)]$ , and the contents of the carbon materials and binders in the active mass are of 0.5-30 wt.% and 5-40 wt.%, resp. The anode active mass layer show high and durable adhesion with the current collectors and inhibits deformation in the repeated charging-discharging cycling.

IC ICM H01M004-66

ICS H01M004-02; H01M004-38; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery anode current

collector surface roughness; stress strain relationship

lithium battery anode current collector;

silicon anode lithium battery current

collector; copper current collector lithium  
battery anode; sintering lithium  
battery anode active mass

IT Fluoropolymers, uses  
(binder in anodes; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT Polyimides, uses  
(binder in anodes; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT Carbon black, uses  
(elec. conductive agents in anodes;  
secondary Li battery anodes contg.  
current collectors with prescribed surface roughness or  
stress-strain relationships)

IT Secondary batteries  
(lithium; secondary Li battery  
anodes contg. current collectors with prescribed surface  
roughness or stress-strain relationships)

IT Sintering  
(of anode active mass; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT Stress-strain relationship  
Surface roughness  
(of current collectors in anodes; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT Battery anodes  
(secondary Li battery anodes contg.  
current collectors with prescribed surface roughness or  
stress-strain relationships)

IT Copper alloy, base  
(current collectors in anodes; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT 7440-21-3, Silicon, uses  
(anode active mass; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT 24937-79-9, Polyvinylidene fluoride  
(binder in anodes; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

IT 7440-50-8, Copper, uses  
(current collectors in anodes; secondary Li  
battery anodes contg. current collectors with  
prescribed surface roughness or stress-strain relationships)

L33 ANSWER 3 OF 3 HCA COPYRIGHT 2007 ACS on STN  
AN 134:355474 HCA Full-text  
TI Battery electrodes including particles of specific sizes  
IN Buckley, James P.; Ghantous, Dania I.; Hoang, Khanh; Horne, Craig  
R.; Bi, Xiangxin  
PA Nanogram Corporation, USA  
SO PCT Int. Appl., 78 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
FAN.CNT 30

PATENT NO.      KIND    DATE      APPLICATION NO.      DATE

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PI WO 2001035473 A1 20010517 WO 2000-US30543

200011

06

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W: CN, IN, JP, KR

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE, TR

EP 1249047 A1 20021016 EP 2000-979141

200011

06

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, FI, CY, TR

JP 2003514353 T 20030415 JP 2001-537112

200011

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TW 488100 B 20020521 TW 2000-89123615

200011

08

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CN 1531480 A 20040922 CN 2001-820305

200110

26

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IN 2002CN00738 A 20070223 IN 2002-CN738

200205

20

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PRAI US 1999-435748 A 19991108 <--

US 2000-243491P P 20001026 <--

WO 2000-US30543 W 20001106 <--

AB Embodiments of electrodes include a collection of particles having an av. diam. less than about 100 nm and have a root mean square surface roughness less than about one micron. Electrodes can be formed with a collection of electroactive nanoparticles having a narrow particle size distribution. Electrodes can be formed having an av. thickness less than about 10 µm that include particles having an av. diam. less than about 100 nm. Thin electrodes can be used in the formation of thin batteries in which at least one of the electrodes includes nanoscale electroactive particles.

IT 7439-93-2, Lithium, uses  
(battery electrodes including particles of specific sizes)

RN 7439-93-2 HCA

CN Lithium (CA INDEX NAME)

Li

IT 7439-93-2D, Lithium, intercalation compd., uses  
(particles; battery electrodes including particles of specific sizes)

RN 7439-93-2 HCA

CN Lithium (CA INDEX NAME)

Li

IC ICM H01M004-36  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST battery electrode nanoparticle  
IT Battery anodes  
    Battery cathodes  
    Nanoparticles  
    Particle size distribution  
    Surface roughness  
        (battery electrodes including particles of specific sizes)  
IT Carbon fibers, uses  
    (battery electrodes including particles of specific sizes)  
IT Metals, uses  
    (particles; battery electrodes including particles of specific sizes)  
IT Thermal decomposition  
    (photo-; battery electrodes including particles of specific sizes)  
IT Lithium alloy, base  
    (battery electrodes including particles of specific sizes)  
IT 1332-29-2, Tin oxide 11099-11-9, Vanadium oxide 11105-02-5,  
    Silver vanadium oxide 11126-12-8, Iron sulfide 11126-15-1,  
    Lithium vanadium oxide 11129-60-5, Manganese oxide  
12612-50-9, Molybdenum sulfide 13463-67-7, Titanium oxide, uses  
39300-70-4, Lithium nickel oxide 39302-37-9,  
    Lithium titanium oxide 39457-42-6, Lithium  
    Manganese oxide 52627-24-4, Cobalt lithium oxide  
80341-49-7, Iron lithium sulfide 121339-43-3,  
    Lithium Silver vanadium oxide 160479-36-7, Lithium  
    tin oxide  
        (battery electrodes including particles of specific sizes)  
IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses  
    (battery electrodes including particles of specific sizes)  
IT 7439-93-2, Lithium, uses  
    (battery electrodes including particles of specific sizes)  
IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses 12597-68-1,  
    Stainless steel, uses  
        (current collector; battery electrodes including  
        particles of specific sizes)  
IT 7439-93-2D, Lithium, intercalation compd., uses  
    (particles; battery electrodes including particles of specific sizes)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> D L34 1-14 BIB ABS HITSTR HITIND

L34 ANSWER 1 OF 14 HCA COPYRIGHT 2007 ACS on STN  
AN 137:224969 HCA Full-text  
TI Fabrication and properties of epitaxial lithium niobate  
    thin films by Combustion Chemical Vapor Deposition (CCVD)  
AU Jiang, Yong Dong; McGee, Jake; Polley, Todd A.; Schwerzel, Robert  
    E.; Hunt, Andrew T.  
CS MicroCoating Technologies, Atlanta, GA, 30341, USA  
SO Materials Research Society Symposium Proceedings (2002),  
    688(Ferroelectric Thin Films X), 297-302

CODEN: MRSPDH; ISSN: 0272-9172

PB Materials Research Society

DT Journal

LA English

AB Lithium niobate has a wide variety of applications because of its excellent ferroelec., piezoelec. and electrooptic properties. In this study, epitaxial lithium niobate thin films were deposited on c-sapphire ( $\alpha$ -Al<sub>2</sub>O<sub>3</sub>) by the low-cost, open-atm. Combustion Chem. Vapor Deposition (CCVD) technique developed by MicroCoating Technologies, Inc. It was found that deposition temp. plays a crit. role in detg. the growth behavior and quality of the lithium niobate thin films. XRD measurements show that the lithium niobate films are epitaxial with two in-plane orientations (twin structure). A surface roughness (root mean square) of about 4 nm was obtained from the deposited film (about 200 nm thick), as measured by optical profilometry.

CC 76-7 (Electric Phenomena)

ST epitaxial lithium niobate film combustion CVD

IT Vapor deposition process

(chem., combustion; fabrication and properties of epitaxial lithium niobate thin films by Combustion chem.

Vapor Deposition (CCVD))

IT Crystal growth

Crystal structure

Surface roughness

(fabrication and properties of epitaxial lithium niobate thin films by Combustion chem. Vapor Deposition (CCVD))

IT 1344-28-1, Alumina, uses

(fabrication and properties of epitaxial lithium niobate thin films by Combustion chem. Vapor Deposition (CCVD))

IT 12031-63-9P, Lithium niobate

(fabrication and properties of epitaxial lithium niobate thin films by Combustion chem. Vapor Deposition (CCVD))

IT 1317-82-4, Sapphire

(substrate; fabrication and properties of epitaxial lithium niobate thin films by Combustion chem.

Vapor Deposition (CCVD))

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 2 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 134:214074 HCA Full-text

TI Diamond Optically Transparent Electrodes: Demonstration of Concept with Ferri/Ferrocyanide and Methyl Viologen

AU Zak, Jerzy K.; Butler, James E.; Swain, Greg M.

CS Faculty of Chemistry, Silesian Technical University, Gliwice,  
44-100, Pol.

SO Analytical Chemistry (2001), 73(5), 908-914

CODEN: ANCHAM; ISSN: 0003-2700

PB American Chemical Society

DT Journal

LA English

AB A new type of optically transparent electrode is reported on - an elec. conductive diamond thin film. The electrode was free-standing (0.38 mm thick and 8 mm in diam.), mech. polished to a 7-nm root- mean-square roughness over a 10- $\mu$ m linear distance, boron-doped (0.05% B/C in the reactant gas mixt.), and mounted in a thin-layer transmission cell. The electrode has a short-wavelength cutoff of apprx.225 nm, which is the indirect band gap of the material, and transmits light out to at least 1000 nm. In theory, the electrode has an optical window from 225 nm well out into the far-IR, except for the boron acceptor band and the intrinsic multiphonon absorptions. The electrode was used to electrooxidize ferrocyanide to ferricyanide, and the absorbance change assocd. with the formation of the oxidized product ( $\lambda_{max} = 420$  nm) was spectroscopically monitored. The electrode was also used to electroreduce Me viologen (MV<sup>2+</sup>) to the cation radical (MV<sup>+•</sup>) and the neutral (MV<sup>0</sup>). The depletion of MV<sup>2+</sup> ( $\lambda_{max} = 257$  nm) and formation of MV<sup>+•</sup> ( $\lambda_{max} = 398$  and 605 nm) were spectroscopically monitored.

CC 72-2 (Electrochemistry)

Section cross-reference(s): 22, 67, 73, 75, 76

IT Electrolytic cells

(spectrochem.; with optically transparent elec. conductive

boron-doped diamond)

RE.CNT 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 3 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 132:229664 HCA Full-text

TI Growth of LiNbO<sub>3</sub> epitaxial films by oxygen radical-assisted laser molecular beam epitaxy

AU Matsubara, K.; Niki, S.; Watanabe, M.; Fons, P.; Iwata, K.; Yamada, A.

CS Electrotechnical Laboratory, Tsukuba, 305-8568, Japan

SO Applied Physics A: Materials Science & Processing (1999), 69(Suppl.), S679-S681

CODEN: APAMFC; ISSN: 0947-8396

PB Springer-Verlag

DT Journal

LA English

AB LiNbO<sub>3</sub> films were epitaxially grown on c-sapphire substrates using O radical-assisted laser MBE. X-ray diffraction-based structural anal. showed that the films were epitaxial. Triple-axis rocking curve measurements of the LiNbO<sub>3</sub> (0006) reflection revealed that the film was highly c-oriented with an extremely narrow mosaic; the full width at half max. of the LiNbO<sub>3</sub> (0006) rocking curve was 0.0036°, comparable to the value of high-quality bulk crystals. The surface of the film was very smooth, with a surface roughness root-mean-square value, measured by at. force microscope, of 0.4 nm for a film of thickness 15 nm. The chem. compn. of the film measured by XPS was stoichiometric within the accuracy of XPS measurement.

CC 75-1 (Crystallography and Liquid Crystals)

ST lithium niobate film oxygen radical assisted laser MBE

IT Composition

Surface roughness

(of lithium niobate epitaxial films grown by oxygen radical-assisted laser MBE)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 4 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 131:79879 HCA Full-text

TI SnO<sub>2</sub>(Sb) electrodes: morphological changes due to polarizations in the HER and OER potential regions studied by in situ STM and ex situ AFM imaging

AU Longo, C.; Abadal, G.; Sanz, F.; Sumodjo, P. T. A.

CS Instituto de Quimica, Universidade de Sao Paulo, Sao Paulo, 05599-970, Brazil

SO Journal of the Electrochemical Society (1999), 146(6), 2169-2174

CODEN: JESOAN; ISSN: 0013-4651

PB Electrochemical Society

DT Journal

LA English

AB The effect of electrochem. perturbation on the microstructure of transparent Sb-doped SnO<sub>2</sub> electrode in 0.1 M NaClO<sub>4</sub>, pH 2, was investigated by in situ scanning tunneling microscopy (STM), ex situ at. force microscopy (AFM), SEM, and other techniques of microstructure anal. The transparent film of SnO<sub>2</sub>(Sb) on silica prepnd. by spray pyrolysis has a uniform and smooth surface with a root-mean-square (rms) roughness ranging from 1 to 2 nm. Its microstructure is constituted of coalesced particles with an av. diam. and height of 30 and 6 nm, resp. Anodic polarization at potentials near the oxygen evolution reaction region (OER) or potential cycling induces small alterations on the microstructure of the electrode, observable only in submicron range by AFM anal. Cathodic polarization at potentials in the region of the hydrogen evolution reaction (HER), however, strongly damages the film. AFM and STM examn. revealed that the particle boundaries are attacked and both vertical and lateral dimensions of the particles decrease. From the observations, it can be inferred that during the cathodic polarization SnO is formed, and destruction of the film occurs by dissoln. of that more sol. oxide. In situ STM expts. showed that at the initial stages the particles of the damaged film can acquire dimensions even larger than the initial size by anodic polarization. Finally, it can be concluded that a smooth and compact film with few defects is less susceptible to degrdn.

IT 1332-29-2, Tin oxide

(Sb-doped; SnO<sub>2</sub>(Sb) electrodes: morphol. changes due to polarizations in HER and OER potential regions studied by in situ

STM and ex situ AFM imaging)  
RN 1332-29-2 HCA  
CN Tin oxide (CA INDEX NAME)  
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CC 72-2 (Electrochemistry)  
Section cross-reference(s): 66  
IT Anodic polarization  
Cathodic polarization  
(of transparent Sb-doped SnO<sub>2</sub> films in NaClO<sub>4</sub> soln.)  
IT 1332-29-2, Tin oxide  
(Sb-doped; SnO<sub>2</sub>(Sb) electrodes: morphol. changes due to  
polarizations in HER and OER potential regions studied by in situ  
STM and ex situ AFM imaging)

RE.CNT 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 5 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 129:47201 HCA Full-text

TI Structural and optical properties of LiNbO<sub>3</sub> films grown by pulsed  
laser deposition with a shadow mask  
AU Kim, Dong-Wook; Oh, Sang-Moon; Lee, See-Hyung; Noh, T. W.  
CS Dep. Physics, Condensed Matter Res. Inst., Seoul Natl. Univ., Seoul,  
151-742, S. Korea  
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short  
Notes & Review Papers (1998), 37(4A), 2016-2020  
CODEN: JAPNDE; ISSN: 0021-4922

PB Japanese Journal of Applied Physics

DT Journal

LA English

AB High-quality LiNbO<sub>3</sub> thin films were grown by pulsed laser deposition (PLD) with a shadow mask. Epitaxial and twin-films were obtained using a single crystal target without a post-annealing process. The film had a very smooth surface without the particular problem, which is common in films grown by conventional PLD. The root-mean-square surface roughness was only 3.6 nm, and optical propagation loss was  $\geq 3$  dB/cm.

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
Properties)

Section cross-reference(s): 75

ST structural optical property lithium niobate film  
; laser deposition shadow mask niobate

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 6 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 128:328979 HCA Full-text

TI Epitaxial LiNbO<sub>3</sub> thin films grown by the "eclipse method"  
AU Kim, Dong-Wook; Oh, Sang-Moon; Noh, T. W.; Lee, See-Hyung  
CS Department of Physics and Condensed Matter Research Institute, Seoul  
National University, Seoul, 151-742, S. Korea

SO Journal of the Korean Physical Society (1998), 32(Suppl.,  
Proceedings of the 9th International Meeting on Ferroelectricity,  
1997, Pt. 4), S1408-S1410  
CODEN: JKPSDV; ISSN: 0374-4884

PB Korean Physical Society

DT Journal

LA English

AB LiNbO<sub>3</sub> thin films were grown by pulsed laser deposition (PLD) with a shadow mask, which is called the eclipse method. Epitaxial twin-free films were obtained using a single crystal target without a post-annealing process. The films had very smooth surface without the particulate problem, which is common in films grown by conventional PLD. The root-mean-square surface roughness was only 3 nm, and optical propagation loss was  $\geq 3$  dB/cm.

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 73

IT Surface smoothness

(of lithium niobate epitaxial film grown by

pulsed laser deposition with shadow mask)

IT Optical properties

(propagation loss; of lithium niobate epitaxial

film grown by pulsed laser deposition with shadow mask)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 7 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 128:315252 HCA Full-text

TI Reduced optical losses in MOCVD grown lithium niobate thin films on sapphire by controlling nucleation density

AU Lee, S. Y.; Feigelson, R. S.

CS Department of Materials Science and Engineering, Stanford University, Stanford, CA, 94305, USA

SO Journal of Crystal Growth (1998), 186(4), 594-606

CODEN: JCRGAE; ISSN: 0022-0248

PB Elsevier Science B.V.

DT Journal

LA English

AB LiNbO<sub>3</sub> epitaxial thin films of high cryst. quality were grown on c-plane sapphire substrates by the solid-source MOCVD method. For waveguiding applications, low optical propagation losses (<2 dB/cm) are required, and this was difficult to achieve in films grown by various vapor growth techniques. Since scattering from rough film surfaces is a major source of optical attenuation, a knowledge of the mechanisms involved in film roughening and their relation with the initial stage of film formation is essential. Roughening and optical losses in Li niobate films grown on sapphire substrates increased with grain size and the depth of grain grooves formed between them. Increasing the nucleation d. during the initial stage of growth can inhibit grain growth, and thereby reduce surface roughness even at high growth temps. Based on these results, a two-step growth process was developed in which the nucleation and growth stages were controlled sep. This process involves (1) creating a high nucleation d. by using either a low deposition temp. or high source partial pressure during the early stages of film growth, and (2) enhancing crystallinity by growing the balance of the film at a higher temp. or lower source partial pressure. Using this refined growth process, root-mean -square roughness was decreased to <2 nm, while the cryst. quality remained equal to the best films grown by the conventional one step growth method. Optical losses were reduced to <1.8 dB/cm for the TEo mode at a wavelength of 632.8 nm.

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 66, 73

IT Optical properties

(loss; reduced optical losses and surface roughness of metalorg.

VPE grown lithium niobate thin films on sapphire by controlling nucleation d.)

IT Crystal nucleation

Metalorganic vapor phase epitaxy

Surface roughness

(reduced optical losses and surface roughness of metalorg. VPE

grown lithium niobate thin films on sapphire

by controlling nucleation d.)

IT 12031-63-9, Lithium niobate (LiNbO<sub>3</sub>)

(reduced optical losses and surface roughness of metalorg. VPE

grown lithium niobate thin films on sapphire

by controlling nucleation d.)

RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 8 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 127:254443 HCA Full-text

TI Sequential in situ STM imaging of electrodissolving copper single-crystal domains in aqueous perchloric acid: kinetics and mechanism of the interface evolution

AU Aziz, S. G.; Vela, M. E.; Andreasen, G.; Salvarezza, R. C.; Hernandez-Creus, A.; Arvia, A. J.

CS Instituto Investigaciones Fisicoquimicas Teoricas Aplicadas (INIFTA), La Plata, 1900, Argent.

SO Physical Review B: Condensed Matter (1997), 56(7),

4166-4175

CODEN: PRBMDO; ISSN: 0163-1829

PB American Physical Society

DT Journal

LA English

AB The evolution of Cu crystal surfaces in an aq. perchloric acid soln. at both null ( $j = 0$ ) and const. **anodic** apparent c.d. ( $j = 6 \mu\text{A cm}^{-2}$ ) at room temp. was followed by *in situ* scanning tunneling microscopy sequential imaging. For  $j = 0$ , the Cu surface turns out to be highly dynamic as terrace growth, step displacement, and smoothening of small pits can be obsd. These processes lead to a small decrease in the value of the root-mean-square roughness ( $\xi$ ). However, for  $j = 6 \mu\text{A cm}^{-2}$ , an inhomogeneous attack proceeds with a marked increase in  $\xi$ . In this case, while some surface domains become progressively rough others develop nm-sized etched pits that turn the interface unstable. The evolution of the Cu topog. under the exptl. conditions of this work was simulated using a Monte Carlo algorithm based on a dissoln. model in which surface processes are influenced by inhomogeneity stabilizing cavities.

IT 7440-50-8, Copper, properties

(sequential *in situ* STM imaging of electrodissolving copper single-crystal domains in aq. perchloric acid: kinetics and mechanism of interface evolution)

RN 7440-50-8 HCA

CN Copper (CA INDEX NAME)

Cu

CC 72-2 (Electrochemistry)

Section cross-reference(s): 56, 66

IT 7440-50-8, Copper, properties

(sequential *in situ* STM imaging of electrodissolving copper single-crystal domains in aq. perchloric acid: kinetics and mechanism of interface evolution)

RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 9 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 124:13187 HCA Full-text

TI In-situ stress investigations on thin copper films with the STM

AU Fries, Thomas; Oster, Klaus; Wandelt, Klaus

CS Inst. Phys. Chem., Univ. Bonn, Bonn, D-53155, Germany

SO Advanced Materials (Weinheim, Germany) (1994), 6(6), 473-6

CODEN: ADVMEW; ISSN: 0935-9648

PB VCH

DT Journal

LA English

AB The effects of external mech. stress at the surface of nanocryst. (cryst. size 50-60 nm) 1  $\mu\text{m}$  thin Cu films prep'd. by an **anodic** vacuum arc on Si(100) were studied. Stress was applied by a sample holder for 3 point bending measurements in the scanning tunneling microscope (STM). Forces as low as 0.2 N resulted in local plastic deformations. Recovery and recrystn. were obsd. by the root mean square surface roughness and structural changes, resp. Qual. and quant. characterization of the structural changes was achieved by evaluation of the STM data for topog. and surface roughness. The rate of transport of material was evaluated.

IT 7440-50-8, Copper, properties

(*in situ* stress investigations including structural surface changes on thin Cu films by STM)

RN 7440-50-8 HCA

CN Copper (CA INDEX NAME)

Cu

CC 56-6 (Nonferrous Metals and Alloys)

IT 7440-50-8, Copper, properties

(*in situ* stress investigations including structural surface changes on thin Cu films by STM)

L34 ANSWER 10 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 123:182003 HCA Full-text

TI Optical losses in ferroelectric oxide thin films: is there light at the end of the tunnel?

AU Fork, D. K.; Armani-Leplingard, F.; Kingston, J. J.

CS Xerox Palo Alto Res. Cent., Palo Alto, CA, 94304, USA

SO Materials Research Society Symposium Proceedings (1995), 361(Ferroelectric Thin Films IV), 155-66

CODEN: MRSPDH; ISSN: 0272-9172

PB Materials Research Society

DT Journal

LA English

AB Optical losses are a barrier to use of ferroelec. waveguide thin films. Losses of .apprx.2 dB/cm will reduce the efficiency of a frequency doubler by over 50%. Achieving losses on this order in conjunction with other essential film properties is difficult. The optical loss has several origins, including absorption, mode leakage, internal scattering and surface scattering. When the film surface morphol. is accurately known, it is possible to est. the surface scattering component of the loss. The authors have employed at. force microscopy and computer modeling to compute, and correlate the optical loss as a function of film thickness and wavelength. The results suggest upper limits to the morphol. roughness for various device applications. For Li niobate films on sapphire which are intended to frequency double into the blue part of the spectrum, the optimal film thickness is .apprx.400 nm and the root-mean-square roughness is constrained .ltorsim.1.0 nm, with some weak dependence on grain size. Although present growth techniques do not appear to achieve this level of surface flatness intrinsically, an understanding of the morphol. development of the film structure may lead to improvements.

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

L34 ANSWER 11 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 122:254821 HCA Full-text

TI Microstructural effects in WO<sub>3</sub> gas-sensing films

AU Antonik, M. D.; Schneider, J. E.; Wittman, E. L.; Snow, K.; Vetrino, J. F.; Lad, R. J.

CS Laboratory for Surface Science and Technology, 5764 Sawyer Research Center, University of Maine, Orono, ME, 04469-5764, USA

SO Thin Solid Films (1995), 256(1-2), 247-52

CODEN: THSFAP; ISSN: 0040-6090

PB Elsevier

DT Journal

LA English

AB The microstructure of 50 nm thick WO<sub>3</sub> films used in surface acoustic wave (SAW) gas sensors was characterized by at. force microscopy (AFM), XRD and cond. measurements. The films were deposited by r.f. magnetron sputtering onto piezoelec. yz-cut LiNbO<sub>3</sub> substrates at 200° and then subjected to annealing treatments in air. As-deposited films are amorphous, have a root-mean-square roughness of 0.6 nm and are easily eroded with the AFM tip. Annealing >315° causes the films to crystallize into a distorted rhodium oxide structure. This crystn. is accompanied by a decrease in film cond. and a surface roughening due to polycryst. grain growth. The cryst. films are more sensitive for H<sub>2</sub>S gas detection and have faster response characteristics than the amorphous films.

CC 79-2 (Inorganic Analytical Chemistry)

Section cross-reference(s): 76

IT 12031-63-9, Lithium niobate (LiNbO<sub>3</sub>)

(characterization of tungsten trioxide film on lithium niobate for surface acoustic wave gas sensor)

L34 ANSWER 12 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 57:75063 HCA Full-text

OREF 57:14867b-d

TI Undamaged germanium surfaces of high optical quality

AU Donovan, T. M.; Seraphin, B. O.

CS Michelson Lab., China Lake, CA

SO Journal of the Electrochemical Society (1962), 109, 877-9

CODEN: JESOAN; ISSN: 0013-4651

DT Journal

LA Unavailable

AB A modification of Sullivan's polishing technique (CA 51, 7902c) gives surfaces of about 0.1 μ/in. flatness and a root mean sq. roughness of only 10-13 Å. After mech. polishing, Ge samples are electropolished cathodically on a cloth-covered wheel, contg. KOH in polishing fluid. C. ds. up to 10 ma./sq. in. result in an etching rate of 0.03 μ/min. Electron diffraction shows the surface orientation of the

electropolished samples to be equiv. to those polished in CP-4 soln. Measurements of the surface recombination velocity indicated that the new surface was undamaged to the extent that it ceased to dominate the recombination process in the surface.

IT 7440-50-8, Copper  
(electrodeposition or electroplating of, a.c. and)  
RN 7440-50-8 HCA  
CN Copper (CA INDEX NAME)

Cu

CC 22 (Electrochemistry)  
IT 7440-50-8, Copper  
(electrodeposition or electroplating of, a.c. and)  
IT 183748-02-9, Electron  
(in germanium anodes, soln. and)

L34 ANSWER 13 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 53:33386 HCA Full-text

OREF 53:5923e-f

TI Side conductors for storage batteries

IN Yamaura, Masao; Sekiguchi, Hideto

PA Yuasa Batteries Co.

DT Patent

LA Unavailable

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 32010272 B4 19571210 JP

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AB A Cu plate, the surface of which is roughened by means of sand blasting or etching, is immersed in a molten solder to form a solder layer, and then coated with Pb in a mold to give a side conductor. A strong joint between the Cu and the Pb is obtained.

CC 4 (Electrochemistry)

IT Storage batteries

(conductors for, Pb-coated Cu plate)

IT Electrodes

(storage-battery, Pb-coated Cu plate)

IT 7439-92-1, Lead

(coatings, on Cu for storage-battery conductors)

IT 7440-50-8, Copper

(storage-battery conductors from Pb-coated)

L34 ANSWER 14 OF 14 HCA COPYRIGHT 2007 ACS on STN

AN 43:500 HCA Full-text

OREF 43:94h-i,95a-e

TI Cleaning. Preparation of metals prior to electrodeposition

AU McNair, R.

SO Metal Ind. (London) (1948), 73, 206-208,247-249,252

DT Journal

LA Unavailable

AB The methods employed for the removal of grease can be divided into 3 sections, org. solvents, alk. chem. and electrochem. cleaners, while scale and other metallic oxides are removed by the use of acids. Other methods include sand or shot-blasting, barreling, grinding, and polishing. Chem. cleaners usually consist of alk. solns. contg. NaOH, sodium metasilicate, KOH, Na<sub>2</sub>CO<sub>3</sub>, Na<sub>3</sub>PO<sub>4</sub>, and chemicals of like nature, the object being to immerse the articles in a boiling soln. contg. a mixt. of the above-mentioned chemicals which emulsifies or saponifies the grease so that it becomes sol. in H<sub>2</sub>O. A method of degreasing that finds much favor for the removal of very heavy grease and oil is the org.-solvent degreaser. Al and Zn should never be made the anode in an alk. cleaner as corrosion will occur that is not easily removed; nor is it advisable to allow Zn articles to be cathodic for more than a min. as the absorption of H<sub>2</sub> may be the cause of blistering of the deposit after the article has been in service a short time. Steel is another metal that should not be allowed to remain the cathode for too long a period as this may cause H<sub>2</sub> embrittlement. Certain chemicals have the power to reduce the surface tension of liquids, and this has been utilized in metal cleaning to assist the penetration of the cleaner. This action is also known as wetting, and the

chemicals employed are usually sulfonated compds. HCl and H<sub>2</sub>SO<sub>4</sub> are generally used for pickling Fe and steel, HNO<sub>3</sub> or a mixt. of HNO<sub>3</sub> and H<sub>2</sub>SO<sub>4</sub> for brass and Cu, while sand and rust can be removed from sand castings by immersion in a mixt. of HF and H<sub>2</sub>SO<sub>4</sub>. The cleaning of brass can be divided into two categories: (a) Where the aim is to obtain a purely decorative finish; this particular bright-dip brass finish is also employed for certain types of plated work when a satin finish is required. (b) Where the cleaning and dipping process is employed as a means of removing grease and scale prior to polishing, plating, or soldering. If a brass finish is desired the usual practice is to lacquer the articles with a clear colorless lacquer to preserve the color. Numerous methods are available for pickling ferrous metals. Of the acids employed, HCl and H<sub>2</sub>SO<sub>4</sub> are the most common, although HF and HNO<sub>3</sub> also have their uses. The Bullard Dun Process consists in making the articles to be treated the cathode in a hot dil. soln. of H<sub>2</sub>SO<sub>4</sub> plus the addn. of a min. quantity of SnSO<sub>4</sub>. Scale on stainless steel resulting from heat-treatment is very resistant to acids and com. pickling is usually carried out at elevated temps. The pickling and etching of Al is adopted as a means of roughening the surface to form a key ground for subsequent painting and etching as a means of obtaining a satin decorative finish on a com. basis.

IT 7440-50-8, Copper  
(cleaning compns. for, before electroplating)

RN 7440-50-8 HCA

CN Copper (CA INDEX NAME)

Cu

CC 9 (Metallurgy and Metallography)

IT 7440-50-8, Copper  
(cleaning compns. for, before electroplating)